**IT Applications Unit 3, AOS 1, Online Communities**

1. Complete the following, from pgs, 28- 32: **Transmission media**

**Networks are classified according to below and we will study the following:**

1. Network Categories: LAN, WAN
2. Network Architecture, client-server; peer-to-peer; internet peer-to-peer; intranet
3. Network communication standards
4. Network hardware and software
5. **Transmission media**
6. Network security

**Transmission media**

**Physical Transmission**

**Twisted – pair cable**

1. What is twisted pair cable?

Twisted pair cable comes as UTP (unshielded twisted pair) or STP(shielded twisted pair) and gains its name by the fact that the cable is made by twisting 8 wires into 4 separate groups then twisted into a group. This is done as it helps to prevent outside interference as the wires aren’t running parallel. Commonly known as CAT (number).

1. Why do new networks use CAT 5E or CAT 6 rather than CAT 3?

New networks use CAT 5E or CAT 6 as opposed to CAT 3 due to the faster transmission rates possible.

1. What are some disadvantages of CAT 5E and why is it used in so many installations?

Some of the main disadvantages of CAT 5E includes that can only be used over a short distance likewise it can’t achieve as high transfer speeds as say cat7 however 1gb transfer rates are still brilliant. The transfer rates is one of the key reasons why it is used as it is a decent transfer rate while an additional reason goes to how it is less stringent on specifications.

1. What type of networks is this cable largely used in?

This cable type is largely used in star networks running cat5 standards.

**Coaxial Cable**

1. Describe the characteristics of this cable.

A coaxial cable contains only 2 wires, the inner wire that is surrounded by insulation and the copper braided, aluminium, tin or lead foil which is followed by another layer of insulation to help lower external interference. It is commonly used to connect a TV to an aerial. One of its key advantages includes how it can reliably carry data over approx. 185 metres at 10 Mbps.

1. What network is it used in?

This transmission media type is commonly used for bus networks with the data travelling both ways to come from the origin computer. Generally no switches are involved.

**Fibre-optic cable**

1. Describe the characteristics of this cable.

Fibre-optic cables consist of special glass or plastic strands that can transmit light pulses at over 1000 various different frequencies simultaneously. This method of transmission isn’t susceptible to electromagnetic interference and so can reliably carry data for distances upto 2KM, with the speed relying on the quality of the light generator and light receiver

1. Why is fibre-optic cable often used to connect major switches inside buildings as well as between buildings.

Fibre-optic cable is often used for major switches amd between buildings as it can often carry signals faster and it isn’t effected by electromagnetic interference.

1. What are the disadvantages of this cable?

One key disadvantage of this cable originates with one its benefits, for the process to work properly and have the light staying within the glass/plastic the cable can have only the ever so slightest curve else severe light leakage can occur.

**Wireless Transmission,** p 30

**Radio Waves**

1. What is required for radio transmissions to occur?

For radio transmissions to occur there needs to be a transmitter to broadcast the signal and a receiver to receive it.

1. Wi-Fi networks use radio waves. What are its advantages over a cable network and what are its disadvantages?

Some key advantages that occur with a Wi-Fi network over a cable network includes mobility as users can move about easily, connectivity for most devices and lack of unsightly cables or need to install them where restricted ie heritage building. However some disadvantages are also prevalent including un-authorised access/use and interference from other sources interfering with the strength and quality.

1. Describe the characteristics of Bluetooth.

Bluetooth uses short-range radio waves to transmit data over a distance of up to 10m. this method can only transfer at speeds of 2Mbps, compared to Wi-Fi which can go upto 108 Mbps or higher over 100m. they operate at 2.45 GHz frequency meaning that there can sometimes be interference with items such as microwave ovens.

**Microwaves**

1. Describe the characteristics of microwave transmission.

Microwave transmission that travel in the spectrum of 3 to 300 GHz requires LOS (line of sight) where there is no obstructions in the way of the sending and receiving dish for successful transmission

1. What are the limitations of microwave transmission?

Some of the key limitations of microwave transmissions relate to the earths atmospheres electromagnetic radiation absorption which renders frequencies above 300 MHz useless.

**Satellite**

1. Satellite transmission can be in what forms?

Satellite transmissions can be either radio or microwaves for transmitting.

1. What are the limitations of this form of transmission?

One of the main limitations that are encountered with this form of transmission is that the distance between the satellite and the earth station can be distance that requires additional strength to be added.

1. Who might use this form of transmission?

This form of transmission of internet is generally used by rural, isolated users. Common uses include TV broadcasts, videoconfrencing, GPS and internet.

**Infra-red**

1. Describe the characteristics of infra-red transmission.

Infra-red transmission uses the same technology as the remote controls for TVs ect. quite effective over short distances (upto 5m) though the transfer rate is slower than cables. This method uses light waves and require LOS.

1. Why is radio wireless networking preferable to infra-red wireless networking?

Radio wireless networking is preferable over infra-red as it allows for use outside of the LOS as well as generally faster speeds.